



Masao Horiba Awards

堀場雅夫賞

Technical Field Selected for 2023 Masao Horiba Awards:

Analysis and measurement technologies that contribute to the development of next generation semiconductor devices

The Masao Horiba Award was established in 2003, to highlight innovative work in analytical measurement technologies. This information is critical to understanding many phenomena and, thus, forms the basis of new scientific research. These properties also form the foundation for the transition of materials to industrial production. For the product and process optimization, these analytical and measurement technologies are indispensable. I hope that the Masao Horiba Award, named after the founder of HORIBA, Ltd., will contribute to illuminating the achievement of researchers who are working hard in the field of analytical and measurement technology. We look forward to receiving many applications for this year's award.

Atsushi Horiba
Chairman & Group CEO
HORIBA, Ltd.

● Eligible fields for 2023 Masao Horiba Awards:

- 1) Analysis and measurement technologies that contribute to the development of new structures and materials and prototyping of devices which are required for the realization of next-generation power devices and optoelectronic devices, and to the establishment of production processes and device mounting processes.
- 2) Analysis and measurement technologies that will contribute to the early realization of next-generation processors that integrate photonics and electronics on a chip, and quantum computing.

*Devices using innovative silicon semiconductor and/or compound semiconductors which are expected to develop in the future, are included in the technical field.

● Eligibility of Applicant

An applicant should be a researcher or an engineer at a university or a public research facility worldwide, engaged in research and development in the field described above. The applicant should fulfill one of the following criteria:

- The applicant is expected to achieve outstanding academic or technological inventions or discoveries in research or development in a field eligible for this award.
- The applicant is expected to solve important academic or technological issues in the field eligible for this award.

The potential of the applicant is taken into account and highly evaluated rather than his/her current achievement.

Applications from outside Japan must be made at the invitation from an employee of a HORIBA Group company.

● Incentive

A certificate of commendation will be presented to each recipient of the 2023 Masao Horiba Award at the award ceremony to be held in Kyoto on October 17, 2023. A supplementary award which is a research subsidy of JPY1,000,000 yen will be presented in the first year, and the same amount of JPY1,000,000 yen will be presented in the next year. The award and the supplementary award will be given on the condition that the winners agree to have their research works to be disclosed to public.

● Submission Deadline

Application deadline: May 12, 2023

Please visit our website to check the details of the application guideline: <https://www.mh-award.org/en/apply/>

● Screening Committee for the 2023 Masao Horiba Awards

Chairperson:

SOMEYA Takao

Professor, Department of Electrical Engineering, Graduate School of Engineering, The University of Tokyo

Judges:

CHEN Yung-Fu

Professor, Department of Electrophysics, National Yang Ming Chiao Tung University (NYCU), Taiwan

KOBAYASHI Masahiro

Managing Executive Officer, Deputy General Manager, R&D Unit, Sumitomo Electric Industries, Ltd.

FUJIMURA Norifumi

Professor, Department of Electronics and Physics, Graduate School of Engineering, Osaka Metropolitan University

MASAHARA Meishoku

Director, Device Technology Research Institute, National Institute of Advanced Industrial Science and Technology (AIST)

TANAKA Satoru

Manager, Analytical & Testing Technology Department, Advanced Analytical Technology Division, HORIBA Techno Service Co., Ltd.

ADAR Fran

Principal Raman Applications Scientist, HORIBA Instruments Incorporated

The recent wave of digitalization is transforming not only IT companies, but also all industries and socioeconomic systems, including manufacturing, mobility, services, agriculture, and healthcare. Due to the expansion of digitalization, the amount of data processing continues to increase steadily, and it is becoming increasingly urgent that semiconductor devices used in Information and Communication Technologies related equipment be upgraded to higher performance. In response to these requirements, there are high expectations for further miniaturization, upscaling of new advanced materials to large substrates and manufacturing new complex 3D structures, leading to the development of innovative devices that didn't exist before. On the other hand, compound semiconductors possess superior characteristics to that of silicon semiconductors in terms of their much faster electron transfer speed, their capabilities of high-speed signal processing and low-voltage operation, and their abilities to respond to light and generate microwaves. As a result, compound semiconductors have grown to be widely used in our daily lives as key materials in semiconductor devices that support digitization. Power semiconductors are used to control a wide variety of electrical devices in our daily lives, including automobiles, industrial equipment, electric power grids, railroads, and home appliances. To realize carbon neutrality, more technological innovations for saving energy are expected. On the other hand, the establishment of innovative electrical transmission technology is also important to achieve higher device speeds and power savings. From this perspective, the establishment of optoelectronics technology that integrates light and electronics for information and communication processing is urgently needed, and the development of optoelectronic devices and optoelectronic fusion processors for the Beyond 5G/6G all-optical era is paramount. In addition, further understanding of phenomena such as superconductivity, ion trapping, and light is needed to realize quantum computers, which will require new analytical and measurement techniques for characterization of devices and products.

Semiconductor devices are built using a wide variety of technologies, from raw materials to wafer fabrication, manufacturing processes, and integration schemes. Analysis and measurement technologies are indispensable in all processes, from the fundamental research level to prototyping and production optimization. Especially in the practical application of innovative devices such as power devices, optical devices, and quantum devices, it is important to find scientific explanation of previously unencountered phenomena and identify control points in prototyping and manufacturing, for which analytical and measurement technologies are becoming increasingly important.

The 2023 Masao Horiba Award is open to advanced analysis and measurement technologies necessary to solve these problems and consequently provide next-generation devices to the world. We welcome applications from researchers and engineers who are working on the development of such analysis and measurement technologies and whose results will lead to advancement in use cases and applications for next-generation devices, such as system autonomy, innovations in transportation, and wearable devices for health and medicine.

Masayuki Adachi, Dr. Eng.
President & COO
HORIBA, Ltd.



2022 Award ceremony

For detailed information, please visit our website.

Masao Horiba Awards website: <https://www.mh-award.org/en/>

